

UNITED STATES DISTRICT COURT
WESTERN DISTRICT OF TEXAS
WACO DIVISION

PARKERVISION, INC.,

Plaintiff,

v.

INTEL CORPORATION,

Defendant.

Case No. 6:20-cv-00108-ADA

JURY TRIAL DEMANDED

THIRD AMENDED COMPLAINT FOR PATENT INFRINGEMENT

Plaintiff ParkerVision, Inc. (“ParkerVision”), by and through its undersigned counsel, files this Amended Complaint against Defendant Intel Corporation (“Intel”) for patent infringement of United States Patent Nos. 6,580,902; 7,539,474; 8,588,725; 9,118,528; 9,246,736 and 9,444,673 (the “patents-in-suit”) and alleges as follows:

NATURE OF THE ACTION

1. This is an action for patent infringement arising under the patent laws of the United States, 35 U.S.C. §§ 1 *et seq.*

PARTIES

2. Plaintiff ParkerVision is a Florida corporation with its principal place of business at 4446-1A Hendricks Avenue, Suite 354, Jacksonville, Florida 32207.

3. On information and belief, Defendant Intel is a Delaware corporation with a place of business at 2200 Mission College Boulevard, Santa Clara, California 95054.

4. On information and belief, Intel has places of business in this judicial district: 1300 S Mopac Expressway, Austin, Texas 78746; 6500 River Place Blvd, Bldg 7, Austin, Texas 78730 and 5113 Southwest Parkway, Austin, Texas 78735 (collectively, “Austin Offices”). <https://www.intel.com/content/www/us/en/location/usa.html>.

5. Intel can be served with process through its registered agent for service in Texas: CT Corporation System, 1999 Bryan Street, Suite 900, Dallas, Texas 75201.

6. On information and belief, since April 1989, Intel has been registered to do business in the State of Texas under Texas Taxpayer Number 19416727436.

JURISDICTION AND VENUE

7. This Court has jurisdiction over the subject matter of this action pursuant to 28 U.S.C. §§ 1331 and 1338(a) because the action arises under the patent laws of the United States, 35 U.S.C. §§ 1 *et seq.*

8. Venue is proper in this judicial district pursuant to 28 U.S.C. §§ 1391(b), (c), (d) and/or 1400(b).

9. Intel is subject to this Court’s personal jurisdiction, in accordance with due process and/or the Texas Long Arm Statute because Intel “[r]ecruits Texas residents, directly or through an intermediary located in this state, for employment inside or outside this state.” *See* Tex. Civ. Prac. & Rem. Code § 17.042.

10. This Court has personal jurisdiction over Intel because Intel has sufficient minimum contacts with this forum as a result of business conducted within the State of Texas and this judicial district. In particular, this Court has personal jurisdiction over Intel because, *inter alia*, Intel, on information and belief: (1) has substantial, continuous,

and systematic business contacts in this judicial district; (2) owns, manages and operates facilities in this judicial district; (3) enjoys substantial income from its operations in this judicial district, and (4) employs Texas residents in this judicial district.

11. Intel has purposefully availed itself of the privileges of conducting business within this judicial district; has established sufficient minimum contacts with this judicial district such that it should reasonably and fairly anticipate being hauled into court in this judicial district; has purposefully directed activities at residents of this judicial district; and at least a portion of the patent infringement claims alleged in this Complaint arise out of or are related to one or more of the foregoing activities.

12. This Court also has personal jurisdiction over Intel because Intel, directly and/or through its subsidiaries, affiliates, or intermediaries, makes, uses, offers for sale, sells, imports, advertises, makes available and/or markets infringing products in the United States, the State of Texas and/or this judicial district, as described more particularly below.

13. On information and belief, Intel maintains a significant physical presence in this judicial district.

14. On information and belief, Intel uses its Austin Offices as a regular and established place of business. On information and belief, Intel has employed over 1700 current and former employees in the Austin area.

<https://www.linkedin.com/company/intel-corporation/people/?facetGeoRegion=us%3A64>.

15. Intel describes its operations in Austin on its website: “Located in the capitol city of Texas, Intel Austin is an important research and development center for the Intel technology that is changing the way we live, work, and play. Among the innovations developed in Austin are core technologies for next-generation microprocessors, platforms and base software; groundbreaking silicon solutions for computing and communications devices, which include handheld computing and cellular communications; and cutting-edge network storage products.”

<https://www.intel.com/content/www/us/en/jobs/locations/united-states/sites/austin.html>.

16. On information and belief, Intel has hundreds of H-1B labor condition applications for people employed in Austin, Texas. https://h1bsalary.online/search?searchtext=INTEL+CORPORATION&year=&minsalary=&state=&worksite_city=AUSTIN&job_title=. Employees holding an H-1B visa are employed in a specialty occupation that requires “theoretical and practical application of a body of highly specialized knowledge . . . and attainment of a bachelor’s or higher degree in the specific specialty.” *See generally* 8 U.S.C. § 1184. As such, Intel employees in Austin, Texas are highly specialized and important to the operation of Intel.

17. Intel lists job openings on its website for positions in Austin, Texas.

The screenshot shows the Intel Careers website. At the top, there are navigation links for 'Discover Intel' and 'Careers at Intel', along with the Intel logo and an 'Accessibility' link. Below the navigation bar, a banner reads 'View great career opportunities at Intel' with a 'Join the talent network' button. The main section is titled 'Job Openings' and shows 'Showing jobs 1 - 14 of 14'. A table lists various job openings with columns for Job Title, Country/Region, City, State, Multiple Locations, and Job Type. The table contains 14 rows of job listings. To the right of the table, there is a sidebar titled 'EMPLOYEE RATINGS & REVIEWS' featuring a quote from a current employee and a link to 'More Intel Corporation Ratings & Reviews (14,282)'.

Job Title	Country/Region	City	State	Multiple Locations	Job Type
JR0125426 - GPU Compute Software Development Engineer	US	Austin	TX		Experienced Hire
JR0124217 - SOC Power Estimation and Power Management Architect	US	Austin	TX	US, Oregon, Hillsboro	Experienced Hire
JR0125389 - Software Engineering Intern	US	Austin	TX		Intern
JR0111562 - Sr. Graphics Software Engineer	US	Austin	TX	US, Pennsylvania, Allentown; US, Oregon, Hillsboro; US, Utah, Lehi; US, California, Santa Clara; US, California, Folsom;	
JR0124439 - Software Memory Compiler Engineer	US	Austin	TX	US, Oregon, Portland	Experienced Hire
JR0121628 - JIT Compiler Engineer	US	Austin	TX		Experienced Hire
JR0113409 - System and Performance Validation Engineer	US	Austin	TX		Experienced Hire
JR0120079 - MPE MNC Product Development Engineer	US	Austin	TX		Experienced Hire
JR0120077 - Product Development Engineer	US	Austin	TX		Experienced Hire
JR0120071 - Product Development Engineer	US	Austin	TX		Experienced Hire
JR0120074 - Product Development Engineer	US	Austin	TX		Experienced Hire
JR0120072 - Product Development Engineer	US	Austin	TX		Experienced Hire
JR0120070 - Product Development Engineer	US	Austin	TX		Experienced Hire
JR0118274 - Physical Design Engineer	US	Austin	TX		College Grad

Showing jobs 1 - 14 of 14

EMPLOYEE RATINGS & REVIEWS

"Awesome place for engineering and freedom of thought/learning!"

★★★★★ Current Employee -
Reviewed Feb 03, 2017

Pros: Strong business orientation; Loads of resources available for ones self learning and growth; No one constraints you with any thing; HR is very empowering for Employees. - Full Review

More Intel Corporation Ratings & Reviews (14,282)

glassdoor

<https://jobs.intel.com/ListJobs/All/Search/state/tx/> (visited on 1/7/2020).

18. On information and belief, Intel has litigated/is litigating cases before this Court in which it admitted that venue was proper, did not contest personal jurisdiction, and/or filed counterclaims. *See, e.g., Flash-Control, LLC v. Intel Corp.*, Case No. 1:19-cv-01107 (W.D. Tex.); *VLSI Tech. LLC v. Intel Corp.*, Case No. 1:19-cv-00977 (W.D. Tex.).

BACKGROUND

19. In 1989, Jeff Parker and David Sorrells started ParkerVision in Jacksonville, Florida. Through the mid-1990s, ParkerVision focused on developing

commercial video cameras, e.g., for television broadcasts. The cameras used radio frequency (RF) technology to automatically track the camera's subject.

20. When developing consumer video cameras, however, ParkerVision, encountered a problem – the power and battery requirements for RF communications made a cost effective, consumer-sized product impractical. So, Mr. Sorrels and ParkerVision's engineering team began researching ways to solve this problem.

21. At the time, a decade's-old RF technology called super-heterodyne dominated the consumer products industry. But this technology was not without its own problems – the circuitry was large and required significant power.

22. From 1995 through 1998, ParkerVision engineers developed an innovative method of RF direct conversion by a process of sampling a RF carrier signal and transferring energy to create a down-converted baseband signal.

23. After creating prototype chips and conducting tests, ParkerVision soon realized that its technology led to improved RF receiver performance, lower power consumption, reduced size and integration benefits. In other words, RF receivers could be built smaller, cheaper and with greater improved performance.

24. ParkerVision's innovations did not stop there. ParkerVision went on to develop additional RF down-conversion technologies, RF up-conversion technologies and other related direct-conversion technologies. ParkerVision also developed complementary wireless communications technologies that involved interactions, processes, and controls between the baseband processor and the transceiver, which improved and enhanced the operation of transceivers that incorporate ParkerVision's

down-converter and up-converter technologies. To date, ParkerVision has been granted over 200 patents related to its innovations including, the patents-in-suit.

25. After spending millions of dollars developing RF technologies, ParkerVision sought to partner with larger, well-established companies who could use ParkerVision's innovations to manufacture highly integrated circuits on a large scale for the consumer market. In the late 1990s, ParkerVision began meeting with companies such as Qualcomm, an industry leader in RF chip technology.

26. Qualcomm quickly recognized the significance of ParkerVision's direct-conversion technology. In internal communications, Qualcomm engineers and senior executives lauded ParkerVision's technology: "This is virtually the holy grail of RF receiver designs -- achievable and within practical limits!"; "[w]e are very impressed with the performance! We can make a phone with [ParkerVision's] parts with higher dynamic range than today's phones" and "[t]he truth is Parker Vision have [sic] stumbled on something revolutionary." After testing ParkerVision's technology, a Qualcomm senior executive and former engineer stated "[t]o tell you the truth, I am more of a believer now than when I started talking with [ParkerVision]" and Qualcomm's then-division President stated "this is critical technology that we must land based on what we have seen so far. It offers revolutionary rf versus power performa[n]ce based on early te[s]t resul[t]s."

27. Qualcomm and ParkerVision never entered into an agreement.

28. Then, in the mid-2000s, with the rise in popularity of smartphones, there became a critical need for smaller, more efficient receivers capable of supporting

multiple frequency bands. ParkerVision's technology addressed this need.

29. In 2011, a ParkerVision engineer found a Qualcomm conference paper describing Qualcomm's then-current RF technology. The technology was strikingly similar to the technology that ParkerVision disclosed to Qualcomm years earlier. Through reverse engineering of Qualcomm's RF chips, ParkerVision confirmed that Qualcomm had been using ParkerVision's patented technology. And, Qualcomm has enjoyed great financial success by doing so. ParkerVision sued Qualcomm and its customers for patent infringement and has been locked in litigation ever since.

30. The damage to ParkerVision, however, was already done. On information and belief, seeing Qualcomm's success, other chip manufacturers such as Intel shifted to using ParkerVision's technology. This shift in the industry ultimately led to the abandonment of super-heterodyne technology.

31. ParkerVision's technology helped make today's mobile devices, such as smart phones and tablets, a reality by enabling RF chips used in these devices to be smaller, cheaper, and more efficient, and with higher performance.

INTEL CHIPS

32. Upon information and belief, Intel (or those acting on its behalf) made, used, sold, offered to sell and/or imported receiver, transmitter, and/or transceiver integrated circuits, for example, for use in cellular devices such as smartphones. These chips include, without limitation, the Intel PMB 5750, PMB 5757 and PMB 5762 ("PMB Chips") and any other receiver, transmitter, and/or transceiver integrated circuits (1) which have down-conversion circuitry configured the same as or equivalent to any of

the PMB Chips and (2) are used (or intended for use in) and/or contained in cellular devices, near field communication devices, smart watches, personal area networks, cable modems, smart meters, DSL modems, Bluetooth devices and/or Wi-Fi devices. The receiver, transmitter, and/or transceiver integrated circuits referenced in this paragraph shall each be referred to as an “Intel Chip” or collectively the “Intel Chips.”

33. Some of the Intel Chips, specifically the PMB Chips, provide cellular connectivity for devices such as Apple iPhones.

34. On information and belief, the PMB 5750 was incorporated into devices including, without limitation, the Apple iPhone 7 and 7 Plus.¹ On information and belief, the PMB 5757 was incorporated into devices including, without limitation, the Apple iPhone 8, 8 Plus and X.² On information and belief, the PMB 5762 was incorporated into devices including, without limitation, the Apple iPhone XR, XS and XS Max.³

35. On information and belief, in December 2019, Apple acquired Intel’s smartphone modem business for \$1 billion. <https://www.engadget.com/2019-12-02-apple-owns-intel-modem-business.html>.

¹ See Wegner et al., *Apple iPhone 7 Teardown*, TechInsights (Sept. 15, 2016), <https://techinsights.com/blog/apple-iphone-7-teardown>; see also Srivatsan Sridhar, *Apple iPhone 7 and 7 Plus teardown confirms bigger battery, Intel LTE modem in some models and more*, FoneArena (Sept. 16, 2016), <https://www.fonearena.com/blog/197580/apple-iphone-7-and-7-plus-teardown-confirms-bigger-battery-intel-lte-modem-in-some-models-and-more.html>.

² See Yang et al., *Apple iPhone X Teardown*, TechInsights (last modified Nov. 8, 2017), <https://www.techinsights.com/blog/apple-iphone-x-teardown>.

³ See *iPhone XS and XS Max Teardown*, iFixit (Sept. 21, 2018), <https://www.ifixit.com/Teardown/iPhone+XS+and+XS+Max+Teardown/113021>; *iPhone XR Teardown*, iFixit (Oct. 26, 2018), <https://www.ifixit.com/Teardown/iPhone+XR+Teardown/114123>.

INTEL'S WILLFUL INFRINGEMENT

36. Before and/or during development of the infringing SMARTi 4, 5, 6, 7 and/or 8 chips, (a) Intel and Infineon⁴ were in possession of ParkerVision's confidential technical information, which is the subject of the patents-in-suit, and (b) on information and belief, Intel and Infineon had knowledge of ParkerVision's then-issued patents-in-suit.

37. Intel and Infineon obtained ParkerVision's confidential technical information through meetings/discussions with ParkerVision when the parties were discussing potential business collaborations. Before Intel acquired Infineon's wireless business unit, ParkerVision met separately with Intel and Infineon regarding ParkerVision's technology.

38. ParkerVision and Intel entered into an NDA on August 5, 1999 and September 27, 2002. By August 1999, ParkerVision had filed several patent applications related to its energy sampling/Direct2Data (D2D) digital RF transceiver technology. By September 2002, ParkerVision had filed more patent applications and obtained patents related to this technology. In discussions between ParkerVision and Intel during this time, ParkerVision discussed, among other things, ParkerVision's patented/patent-pending D2D technology.

39. The patents/patent applications that were filed and/or issued at the times ParkerVision and Intel were having discussions, as well as their progeny, are the

⁴ In January 2011, Intel acquired Infineon's wireless business unit, including Infineon's SMARTi chip technology, engineers who developed SMARTi chip technology, and other employees.

patents-in-suit. ParkerVision's D2D technology is the subject matter of the claims of the patents-in-suit and used in the infringing SMARTi 4, 5, 6, 7, and 8 chips. On information and belief, the same energy transfer technology used in the SMARTi chips was incorporated into infringing Intel Wi-Fi chips.

40. In 2002, ParkerVision attended the 2002 IEEE MTT-S INTERNATIONAL MICROWAVE SYMPOSIUM in Seattle, WA from June 2-7, 2002. On June 2, 2002, David Sorrells and Gregory Rawlins of ParkerVision made a presentation at a workshop (WSC: DIRECT CONVERSION TRANSCEIVERS FOR CELLULAR & WIRELESS APPLICATION) entitled "A Direct Conversion 802.11b Transceiver Design Based on Energy Sampling." On information and belief, Harald Pretl from Infineon was in attendance at this workshop.

41. On information and belief, internal email communications show that at least as early as August 21, 2002, Infineon employees, including engineers who developed the infringing SMARTi chip technology (e.g., Zdravko Boos, an Infineon concept engineer for the accused SMARTi chips), were aware of and monitoring ParkerVision and the technologies ParkerVision was developing.

42. On January 21, 2005, Zdravko Boos sent an email to Bernd Adler (Infineon's head of concept engineering/RF system engineering including for SMARTi chips)⁵ and others at Infineon. The email forwarded a ParkerVision press release discussing ParkerVision's "patented Direct2Data (D2D) digital RF transceiver

⁵ On information and belief, Mr. Adler subsequently became Intel Head of Wireless System Engineering (division VP Systems & Architectures) and Wireless CTO.

technology.”

43. In February 2006, Jeff Leach of ParkerVision sent an email to Gerhard Schmidt (an engineer and Director, RF System Development) of Infineon to set up a meeting at 3GSM Congress conference in Barcelona, Spain. Mr. Schmidt forward the email to Bernd Adler who forwarded the email to Infineon RF engineers - Zdravko Boos, Stefan Herzinger, Rudolf Koch and Jan-Erik Mueller.

44. In February 2006, ParkerVision attended the 3GSM Congress conference in Barcelona, Spain. Interested in ParkerVision technology, on February 14, 2006, Infineon representatives (Gerhard Schmidt, Stefan Wolff (Vice President & General Manager RF Engine Business Unit) and Joseph Strobl (Director, RF Product Marketing)) met at the conference with ParkerVision (Jeffrey Parker (CEO), John Stuckey (VP Business Development), Jeff Leach (Key Accounts Manager), and Charley Moses (Senior Engineer and one of the inventors of the patents-in-suit)). Mr. Leach kept contemporaneous notes of the meeting. At that meeting, ParkerVision discussed its D2D technology with Infineon.

45. On February 20, 2006, Mr. Leach sent an email to Messrs. Schmidt, Wolff and Strobl forwarding ParkerVision’s 86-page White Paper on D2D technology, a 4-page short writeup regarding D2D technology and the presentation ParkerVision made at the meeting.

46. In April 2006, ParkerVision and Infineon planned a follow-up meeting. Infineon sent ParkerVision an agenda that included “[u]nderstanding direct2data,” “status of parkervisions designs and next steps” and “discussion of the concepts and

possible use for IFX [Infineon] products like 2g/3G transceivers.” Infineon stated “We consider this to be a technical meeting which helps us understand what is behind ParkerVision’s concept like [] d2d etc. and to enable us to figure out how useful it might be to enhance Infineon’s next product generation.” In preparation for the meeting, Mr. Leach told Infineon that “In our presentation, we cover a very high level of D2D (although as time permits we can tell you how we have done d2d)”

47. On April 26, 2006 at Infineon’s facilities in Munich, Germany, Jeff Parker, ParkerVision’s CEO, and three ParkerVision colleagues met for six hours with Infineon - Zdravko Boos, Stefan Herzinger (System Engineer), Rudolf Koch (Innovation Manager), Jan-Erik Mueller (PA Expert) and Adrian Etzbach (Marketing Manager)). On information and belief, the engineers at this meeting were part of the team developing SMARTi chips.

48. At the April 26 meeting, ParkerVision discussed ParkerVision’s D2D technology, and gave a high level presentation of its inventive up-conversion “D2P technology.” Mr. Leach contemporaneously memorialized that meeting and noted “A brief discussion about d2d occurred here. *Infineon asked about our IP2 and IP3 numbers. *I also made a note to send the patent numbers and white paper.” Further, at this meeting, Mr. Koch asked Mr. Leach for a business proposal from ParkerVision that the parties could discuss in parallel with their discussions about ParkerVision’s technology.

49. At the meeting, Infineon provided an excuse and informed ParkerVision that Infineon did not want to sign a Non-Disclosure Agreement (NDA) with

ParkerVision. On May 4, 2006, Mr. Leach sent an email to Infineon (Messrs. Koch, Muller, Schmidt, Wolff, Strobl, Eitzbach) thanking them for their time and noting action items including “Send the White paper on d2d” (which Infineon already had) and “Send IP2 and IP3 numbers for d2d,” which were the topic of conversation at the meeting.

50. On information and belief, Jeff Leach forwarded the promised d2d materials to Infineon.

51. On May 3, 2006, Joseph Strobl sent an email to Messrs. Koch and Adler. That same day, Mr. Koch set up a meeting on May 9, 2006 regarding ParkerVision.

52. Notably, in a 2005/2006 employee review for Zdravko Boos, one of his five specific tasks for the year was an “[a]ssessment of . . . ParkerVision.” But because of a purported “very high royalty cost” and unknown to ParkerVision, Infineon internally decided to reject cooperation efforts with ParkerVision.

53. On information and belief, despite deciding early on that Infineon did not want to pay ParkerVision’s perceived “very high royalty cost,” Infineon continued to evaluate and monitor ParkerVision’s patented technologies while leading ParkerVision to believe that Infineon was exploring potential business relationships with ParkerVision.

54. While ParkerVision was discussing its inventive patented D2D and D2P technologies with Infineon in and around 2006 and 2007, Intel was aware of and, on information and belief, was also monitoring ParkerVision and its inventive technologies, which Shmuel Ravid (Intel, Senior Principal Engineer) in internal

communications referred as “groundbreaking” IP.

55. On Sept. 14, 2007, Mr. Boos set up a meeting related to ParkerVision for Sept. 18, 2007, setting aside 1.5 hours. On Sept. 18, 2007, Mr. Boos sent an email to numerous Infineon employees pushing a meeting back to allow for a ParkerVision presentation, which indicated that numerous employees were well aware of ParkerVision and its technology.

56. In August 2008, Mr. Boos investigated ParkerVision’s financials. Mr. Boos emails Mr. Adler and says he is looking at the “competitors’ financial reports,” referencing ParkerVision. Mr. Adler set up a 1.5 hour meeting with Mr. Boos regarding ParkerVision for Sept. 29, 2008.

57. Despite Infineon having internally rejected collaboration with ParkerVision in 2006 because of a “very high royalty cost,” around October 2008, Bernhard Straub sent an email to Mr. Boos stating “[REDACTED]

[REDACTED] On Oct. 10, 2008, Mr. Straub set up a meeting for Oct. 17, 2008 with Mr. Boos for one hour to discuss this topic.

58. In Mr. Boos’s employee evaluation at the end of 2008, Mr. Boos stated that one of his seven tasks for 2008/2009 was an “assessment of . . . ParkerVision.” On Jan. 26, 2009, Mr. Boos requested funds from Mr. Adler from “the possible ParkerVision cooperation” for another project he was pursuing.

59. Thereafter, on February 6, 2009, Hubert Baierl (Infineon, Business Development Cellular Wireless Products) reached out to Mr. Boos stating that he

learned that Mr. Boos had “taken a look into ParkerVision’s technology” and asks about his conclusions. Mr. Baierl sets up a meeting with Mr. Boos for Feb. 11, 2009 regarding ParkerVision.

60. During this February 2009 timeframe, the Infineon team makes inquiries as to whether Infineon had an NDA in place with ParkerVision, but learned that the NDA expired in the end of 2008.

61. In January 19, 2009, ParkerVision and Infineon entered into an NDA regarding a potential business relationship regarding “Infineon’s RF Transceivers for possible use through integration with ParkerVision’s RF solutions for resale.”

62. On information and belief, in February/March 2009, ParkerVision and Infineon met once again to discuss ParkerVision’s technology and a potential business deal. In that regard, Infineon proposed providing ParkerVision with access to Infineon’s transceiver chips so that “PV could develop an RF module with Infineon based on PV technology platform.”

63. On information and belief, in June 2010, both Infineon and Intel had an opportunity to purchase patents from Skyworks and as part of the diligence materials, Skyworks identified seventy-four ParkerVision patents, as being the dominant patents in RF architecture. These patents including the then-issued patents-in-suit including 6,266,518; 6,580,902; 7,110,444; 7,539,474 as well as U.S. patent nos. 6,061,551 (the priority patent for the 6,266,518; 6,580,902; 9,118,528; 9,246,736 and 9,444,673). One information and belief, multiple employees involved in the design of the SMARTi chips received and reviewed this diligence material. Mr. Boos was provided with this diligence material

and, on information and belief, was aware of ParkerVision's patents listed therein.

64. On information and belief, in 2010, Intel and Infineon entered into negotiations whereby Intel would acquire Infineon's wireless business. Thereafter, in January 2011, Intel acquired Infineon's wireless business including employees and Infineon's SMARTi products and technology.

65. On information and belief, Messrs. Boos and Adler, as well as other Infineon engineers and executives who had been evaluating and tracking ParkerVision and its inventive technologies, became Intel employees who worked along with Intel engineers in designing and developing subsequent versions of what now became Intel RF transceiver chips, including the infringing SMARTi 4, 5, 6, 7 and 8 chips.

66. On information and belief, website monitoring reports show that both Infineon and Intel made dozens of visits to ParkerVision's website (which is dedicated to ParkerVision's technology and patents) beginning at least as early as 2008 and continued through February 3, 2020, just a few days before ParkerVision commenced this action on February 11, 2020. On information and belief, the Infineon and Intel engineers were from those companies' facilities located in, for example, Grasbrunn and Neubiberg, Germany; Beijing and Shanghai, China; Bayan Lepas, Malaysia; Santa Clara and Folsom, California; and Hillsboro, Oregon. On information and belief, Intel engineers searched ParkerVision's website for technical content relating to, for example, "UHF down converter," "polar modulator," and "iq modulator"

67. On May 4, 2016, ParkerVision filed an Application for Issuance of Subpoena *Duces Tecum* and Subpoena *Ad Testificandum* to Intel Corp ("Application") in

Certain RF Capable Integrated Circuits and Products Containing the Same (ITC, Inv. No. 337-TA-982). PV_039870-39941. The subpoena sought documents and testimony related to Intel RF capable integrated circuits and products containing RF capable integrated circuits, including any product that Intel made that fell within the scope of the ITC Investigation and Intel devices that were incorporated into at least the Apple iPhone 7. The subpoena identified the '528 patent, one of the patents-in-suit, as covering Intel RF capable integrated circuits. The Application and subpoena allege that Apple iPhone 7 phones incorporating Intel chips (e.g., SMARTi 5) infringe the '528 patent, among other patents.

68. On information and belief, on or shortly after May 4, 2016, ParkerVision served the application and subpoena on Intel.

69. On May 12, 2016, Intel's outside counsel reached out to ParkerVision's counsel regarding the subpoena.

70. In 2016, Daniel Schwartz (an engineer who was involved in the development the SMARTi 7 receiver side architecture) was working on supporting Intel legal on the ParkerVision matter. On information and belief, Mr. Schwartz's work with the legal team related to at least the subpoena and the '528 patent.

71. On information and belief, Intel was given notice of European patent no. 1135853 ("EP853") at least as early as February 2017 in relation to ParkerVision's amended complaint for patent infringement filed against Apple Inc. in the Munich Regional Court in Germany.

72. On information and belief, Intel engineers and executives supported and

worked with Apple in defending Apple against ParkerVision's infringement claims. The accused products in the German litigation were Apple iPhone 7 phones that incorporated infringing Intel RF chips (PMB 5750 - SMARTi 5).

73. On information and belief, Intel was given notice of U.S. patent Nos. 6,687,493; 6,049,706; 6,580,902; 6,560,301; and 6,061,551 ("EP853 Priority Patents") at least as early as February 2017.

74. EP853 claims priority of the EP853 Priority Patents, which are listed on the face of EP853.

75. From at least as early as 1999 up to the filing of this present lawsuit, Infineon's and Intel's longstanding and continual monitoring and evaluations of ParkerVision's technologies, communications and meetings between ParkerVision and Infineon and Intel about ParkerVision's inventive technology and patents and potential business relationships, Infineon's and Intel's internal documents and emails, Infineon's and Intel's dozens of searches and visits to ParkerVision's website, Intel's involvement in the German litigation, and the subpoena Intel received in the ITC investigation, show that Intel knew of each of the patents-in-suit before this suit commenced.

76. On information and belief, Intel chose to use ParkerVision's "groundbreaking" IP in the infringing SMARTi 4, 5, 6, 7 and 8 chips when it knew or should have known that its conduct infringed each of the patents-in-suit. On information and belief, the same energy transfer technology used in the infringing SMARTi chips was incorporated into infringing Intel Wi-Fi chips.

THE ASSERTED PATENTS

United States Patent No. 6,580,902

77. On June 17, 2003, the United States Patent and Trademark Office duly and legally issued United States Patent No. 6,580,902 (“the ‘902 patent”) entitled “Frequency Translation Using Optimized Switch Structures” to inventor David F. Sorrells et al.

78. The ‘902 patent is presumed valid under 35 U.S.C. § 282.

79. ParkerVision owns all rights, title, and interest in the ‘902 patent.

United States Patent No. 7,539,474

80. On May 26, 2009, the United States Patent and Trademark Office duly and legally issued United States Patent No. 7,539,474 (“the ‘474 patent”) entitled “DC Offset, Re-Radiation, and I/Q Solutions Using Universal Frequency Translation Technology” to inventor David F. Sorrells et al.

81. The ‘474 patent is presumed valid under 35 U.S.C. § 282.

82. ParkerVision owns all rights, title, and interest in the ‘474 patent.

United States Patent No. 8,588,725

83. On November 19, 2013, the United States Patent and Trademark Office duly and legally issued United States Patent No. 8,588,725 (“the ‘725 patent”) entitled “Apparatus, System, and Method For Down Converting and Up-Converting Electromagnetic Signals” to inventor David F. Sorrells et al.

84. The ‘725 patent is presumed valid under 35 U.S.C. § 282.

85. ParkerVision owns all rights, title, and interest in the ‘725 patent.

United States Patent No. 9,118,528

86. On August 25, 2015, the United States Patent and Trademark Office duly

and legally issued United States Patent No. 9,118,528 (“the ’528 patent”) entitled “Method and System for Down-Converting an Electromagnetic Signal, and Transforms for Same, and Aperture Relationships” to inventor David F. Sorrells et al.

87. The ’528 patent is presumed valid under 35 U.S.C. § 282.

88. ParkerVision owns all rights, title, and interest in the ’528 patent.

United States Patent No. 9,246,736

89. On January 26, 2016, the United States Patent and Trademark Office duly and legally issued United States Patent No. 9,246,736 (“the ’736 patent”) entitled “Method and System for Down-Converting an Electromagnetic Signal” to inventor David F. Sorrells et al.

90. The ’736 patent is presumed valid under 35 U.S.C. § 282.

91. ParkerVision owns all rights, title, and interest in the ’736 patent.

United States Patent No. 9,444,673

92. On September 13, 2016, the United States Patent and Trademark Office duly and legally issued United States Patent No. 9,444,673 (“the ’673 patent”) entitled “Methods and Systems for Down-Converting a Signal Using a Complementary Transistor Structure” to inventor David F. Sorrells et al.

93. The ’673 patent is presumed valid under 35 U.S.C. § 282.

94. ParkerVision owns all rights, title, and interest in the ’673 patent.

CLAIMS FOR RELIEF

COUNT I - Infringement of United States Patent No. 6,580,902

95. The allegations set forth above are re-alleged and incorporated by

reference as if they were set forth fully here.

96. Intel directly infringes (literally and/or under the doctrine of equivalents) the '902 patent by making, using, selling, offering for sale, and/or importing into the United States products covered by at least claim 1 of the '902 patent.

97. Upon information and belief, Intel products that infringe one or more claims of the '902 patent include, but are not limited to, the Intel Chips, and any other Intel device that is capable of down-converting a higher-frequency signal to a lower-frequency signal as claimed in the '902 patent. On information and belief, Intel uses the Intel Chips at least by testing the Intel Chips in the United States.

98. Upon information and belief, each Intel Chip is/includes a circuit for down-converting an electromagnetic signal (e.g., high frequency RF signal) to a lower frequency signal. Each Intel Chip includes an energy transfer module having a switch module (e.g., module with one or more transistors) and an energy storage module (e.g., module with one or more capacitors). The energy transfer module of the Intel Chip samples the electromagnetic signal at an energy transfer rate (e.g., LO rate with a 25% duty cycle), according to an energy transfer signal (e.g., LO signal), to obtain sampled energy. The sampled energy is stored by said energy storage module (e.g., one or more capacitors). A down-converted signal (e.g., baseband signal) is generated from the sampled energy.

99. The energy transfer module of each Intel Chip has transistors coupled together. The transistors have a common first port, a common second port, and a common control port. The electromagnetic signal is accepted at the common first port

and the sampled energy is present at the common second port.

100. The common control port accepts the energy transfer signal, which has a control frequency that is substantially equal to said energy transfer rate.

101. Each of the transistors of the Intel Chip has a drain, a source, and a gate. The common first port couples together drains of the transistors, the common second port couples together sources of the transistors, and the common control port couples together gates of the transistors.

102. ParkerVision has been damaged by the direct infringement of Intel and is suffering and will continue to suffer irreparable harm and damages as a result of this infringement.

103. On information and belief, Intel's infringement of the '902 patent was and continues to be willful.

104. ParkerVision has been damaged by the direct infringement of Intel and is suffering and will continue to suffer irreparable harm and damages as a result of this infringement.

COUNT II - Infringement of United States Patent No. 7,539,474

105. The allegations set forth above are re-alleged and incorporated by reference as if they were set forth fully here.

106. Intel directly infringes (literally and/or under the doctrine of equivalents) the '474 patent by making, using, selling, offering for sale, and/or importing into the United States products covered by at least claim 1 of the '474 patent.

107. Upon information and belief, Intel products that infringe one or more

claims of the '474 patent include, but are not limited to, the Intel Chips, and any other Intel device that is capable of down-converting a higher-frequency signal to a lower-frequency signal as claimed in the '474 patent. On information and belief, Intel uses the Intel Chips at least by testing the Intel Chips in the United States.

108. Upon information and belief, each Intel Chip is/includes an apparatus for down-converting an input signal (e.g., high frequency RF signal) to a lower frequency signal. Each Intel Chip includes a first frequency down-conversion module that receives an input signal (e.g., high frequency RF signal), wherein the first frequency down-conversion module down-converts the input signal according to a first control signal (e.g., LO signal) and outputs a first down-converted signal (e.g., baseband signal); a second frequency down-conversion module that receives the input signal, wherein the second frequency down-conversion module down-converts the input signal according to a second control signal (e.g., LO signal) and outputs a second down-converted signal (e.g., baseband signal); and a combining module (e.g., module with a differential amplifier) that combines the second down-converted signal with the first down-converted signal and outputs a single channel down-converted signal.

109. The first frequency down-conversion module of each Intel Chip includes a first switch (e.g., transistor) and a first storage element (e.g., one or more capacitors), wherein the first switch is coupled to the first storage element at a first node (e.g., port) and coupled to a first reference potential (e.g., ground).

110. The second frequency down-conversion module of each Intel Chip includes a second switch (e.g., transistor) and a second storage element (e.g., one or

more capacitors), wherein the second switch is coupled to the second storage element at a second node (e.g., port) and coupled to a second reference potential (e.g., ground).

111. On information and belief, Intel's infringement of the '474 patent was and continues to be willful.

112. ParkerVision has been damaged by the direct infringement of Intel, and is suffering and will continue to suffer irreparable harm and damages as a result of this infringement.

COUNT III - Infringement of United States Patent No. 8,588,725

113. The allegations set forth above are re-alleged and incorporated by reference as if they were set forth fully here.

114. Intel directly infringes (literally and/or under the doctrine of equivalents) the '725 patent by making, using, selling, offering for sale, and/or importing into the United States products covered by at least claim 1 of the '725 patent.

115. Upon information and belief, Intel products that infringe one or more claims of the '725 patent include, but are not limited to, the Intel Chips and any other Intel device that is capable of down-converting a higher-frequency signal to a lower-frequency signal as claimed in the '725 patent. On information and belief, Intel uses the Intel Chips at least by testing the Intel Chips in the United States.

116. Upon information and belief, each Intel Chip is/includes an apparatus for down-converting an electromagnetic signal (e.g., high frequency RF signal) to a lower frequency signal. Each Intel Chip has an aliasing module comprising a switching device (e.g., transistor) and a storage module (e.g., capacitor). The aliasing module receives as

an input an RF information signal and provides as an output a down-converted signal. The switching device of the aliasing module receives as an input a control signal (e.g., LO signal) that controls a charging and discharging cycle of the storage module by controlling the switching device so that a portion of energy is transferred from the RF information signal to the storage module during a charging part of the cycle and a portion of the transferred energy is discharged during a discharging part of the cycle.

117. The control signal operates at an aliasing rate (e.g., LO rate with a 25% duty cycle) selected so that energy of the RF information signal is sampled and applied to the storage module at a frequency that is equal to or less than twice the frequency of the RF information signal. The storage module generates the down-converted signal from the alternate charging and discharging applied to the storage module using the control signal.

118. On information and belief, Intel's infringement of the '725 patent was and continues to be willful.

119. ParkerVision has been damaged by the direct infringement of Intel, and is suffering and will continue to suffer irreparable harm and damages as a result of this infringement.

COUNT IV – Infringement of United States Patent No. 9,118,528

120. The allegations set forth above are re-alleged and incorporated by reference as if they were set forth fully here.

121. Intel directly infringes (literally and/or under the doctrine of equivalents) the '528 patent by making, using, selling, offering for sale, and/or importing into the

United States products covered by at least claim 1 of the '528 patent.

122. Upon information and belief, Intel products that infringe one or more claims of the '528 patent include, but are not limited to, the Intel Chips and any other Intel device that is capable of down-converting a higher-frequency signal to a lower-frequency signal as claimed in the '528 patent. On information and belief, Intel uses the Intel Chips at least by testing the Intel Chips in the United States.

123. Upon information and belief, each Intel Chip is/includes a system for frequency down-converting a modulated carrier signal (e.g., high frequency RF signal) to a baseband signal. Each Intel Chip includes a first switch (e.g., transistor) coupled to a first control signal (e.g., LO signal) which comprises a sampling aperture (e.g., 25% duty cycle) with a specified frequency, wherein the first switch is on and a portion of energy that is distinguishable from noise is transferred from the modulated carrier signal (e.g., high frequency RF signal) as an output of said first switch during the sampling aperture of the first control signal.

124. Each Intel Chip includes a first energy storage element (e.g., one or more capacitors) that stores the transferred energy from the modulated carrier signal and outputs a down-converted in-phase baseband signal portion of said modulated carrier signal.

125. Each Intel Chip includes a second switch (e.g., transistor) coupled to a second control signal (e.g., LO signal) which comprises a sampling aperture (e.g., 25% duty cycle) with a specified frequency, wherein the second switch is on and a portion of energy that is distinguishable from noise is transferred from the modulated carrier

signal (e.g., high frequency RF signal) as an output of said second switch during the sampling aperture of the second control signal.

126. Each Intel Chip includes a second energy storage element (e.g., one or more capacitors) that stores the transferred energy from the modulated carrier signal and outputs a down-converted inverted in-phase baseband signal portion of said modulated carrier signal.

127. The portions of transferred energy from each of the first and second switch are integrated over time to accumulate said portions of transferred energy from which said down-converted in-phase baseband signal portion and said down-converted inverted in-phase baseband signal portion are derived.

128. Each Intel Chip includes a first differential amplifier circuit that combines said down-converted in-phase baseband signal portion with said down-converted inverted in-phase baseband signal portion and outputs a first channel down-converted differential in-phase baseband signal.

129. On information and belief, Intel's infringement of the '528 patent was and continues to be willful.

130. ParkerVision has been damaged by the direct infringement of Intel, and is suffering and will continue to suffer irreparable harm and damages as a result of this infringement.

COUNT V - Infringement of United States Patent No. 9,246,736

131. The allegations set forth above are re-alleged and incorporated by reference as if they were set forth fully here.

132. Intel directly infringes (literally and/or under the doctrine of equivalents) the '736 patent by making, using, selling, offering for sale, and/or importing into the United States products covered by at least claim 1 of the '736 patent.

133. Upon information and belief, Intel products that infringe one or more claims of the '736 patent include, but are not limited to, the Intel Chips and any other Intel device that is capable of down-converting a higher-frequency signal to a lower-frequency signal as claimed in the '736 patent. On information and belief, Intel uses the Intel Chips at least by testing the Intel Chips in the United States.

134. Upon information and belief, each Intel Chip is/includes a system for frequency down-converting a modulated carrier signal (e.g., high frequency RF signal) to a demodulated baseband signal. Each Intel Chip has a first switch (e.g., transistor) coupled to a first control signal (e.g., LO signal) which comprises a first sampling aperture (e.g., 25% duty cycle) with a specified frequency, wherein the first switch is on during the first sampling aperture and wherein the first switch is off outside the first sampling aperture.

135. Each Intel Chip has a first energy storage element (e.g., one or more capacitors), coupled to said first switch, that outputs a down-converted in-phase baseband signal portion of the modulated carrier signal.

136. Each Intel Chip has a second switch (e.g., transistor) coupled to a second

control signal (e.g., LO signal) which comprises a second sampling aperture (25% duty cycle) with a specified frequency, wherein the second switch is on during the second sampling aperture and wherein the first switch is off outside the second sampling aperture.

137. Each Intel Chip has a second energy storage element (e.g., one or more capacitors), coupled to the second switch, that outputs a down-converted inverted in-phase baseband signal portion of the modulated carrier signal.

138. The first and second control signals each control a charging and discharging cycle of their respective energy storage element so that for each switch a portion of energy from the modulated carrier signal is transferred to the respective energy storage element when the respective switch is on during the charging cycle, and a portion of previously transferred energy is discharged during the discharging cycle for each respective switch when the respective switch is off.

139. For each respective energy storage element, the energy discharged during any given discharge cycle is not completely discharged, with the remaining undischarged energy from the given discharge cycle becoming an initial condition for a next charging cycle that begins immediately following the given discharge cycle.

140. The down-converted in-phase baseband signal portion is derived from energy accumulated at the first energy storage element during both the charging and the discharging cycles for the first energy storage element. The down-converted inverted in-phase baseband signal portion is derived from energy accumulated at the second energy storage element during both the charging and the discharging cycles for

the second energy storage element.

141. Each Intel Chip has a first differential amplifier circuit that combines the down-converted in-phase baseband signal portion with the down-converted inverted in-phase baseband signal portion and outputs a first channel down-converted differential in-phase baseband signal.

142. On information and belief, Intel's infringement of the '736 patent was and continues to be willful.

143. ParkerVision has been damaged by the direct infringement of Intel, and is suffering and will continue to suffer irreparable harm and damages as a result of this infringement.

COUNT VI - Infringement of United States Patent No. 9,444,673

144. The allegations set forth above are re-alleged and incorporated by reference as if they were set forth fully here.

145. Intel directly infringes (literally and/or under the doctrine of equivalents) the '673 patent by making, using, selling, offering for sale, and/or importing into the United States products covered by at least claim 1 of the '673 patent.

146. Upon information and belief, Intel products that infringe one or more claims of the '673 patent include, but are not limited to, the Intel Chips and any other Intel device that is capable of down-converting a higher-frequency signal to a lower-frequency signal as claimed in the '673 patent. On information and belief, Intel uses the Intel Chips at least by testing the Intel Chips in the United States.

147. Upon information and belief, each Intel Chip is/includes an apparatus for

down-converting an input modulated carrier signal (e.g., high frequency RF signal) to a demodulated baseband signal, wherein the modulated carrier signal has an amplitude variation, a phase variation, a frequency variation, or a combination thereof.

148. Each Intel Chip has a frequency down-conversion module that has a switch (e.g., transistor), a capacitor coupled to said switch, and a pulse generator (e.g., LO) coupled to the switch. The pulse generator outputs pulses to the switch at a rate (e.g., LO rate with a 25% duty cycle) that is a function of a frequency of the modulated carrier signal and a frequency of the demodulated baseband signal determined according to: (the frequency of the modulated carrier signal \pm a frequency of the demodulated baseband signal) divided by N, where N is any integer including 1.

149. The pulses have apertures and the pulses cause the switch to open outside of the apertures and cause the switch to close and sample the modulated carrier signal during the apertures by transferring energy from the modulated carrier signal and accumulating the transferred energy in the capacitor each time the switch is closed.

150. Some of the previously accumulated energy is discharged from the capacitor into load circuitry (e.g., a differential amplifier) each time said switch is open. The demodulated baseband signal is generated from (a) the accumulating of the energy transferred to the capacitor each time the switch is closed and (b) the discharging of the some of the previously accumulated energy into the load circuitry each time the switch is opened.

151. On information and belief, Intel's infringement of the '673 patent was and continues to be willful.

152. ParkerVision has been damaged by the direct infringement of Intel, and is suffering and will continue to suffer irreparable harm and damages as a result of this infringement.

JURY DEMANDED

Pursuant to Rule 38(b) of the Federal Rules of Civil Procedure, ParkerVision hereby requests a trial by jury on all issues so triable.

PRAYER FOR RELIEF

WHEREFORE, ParkerVision respectfully requests that the Court enter judgment in its favor and against Intel as follows:

- a. finding that Intel directly infringes one or more claims of each of the patents-in-suit;
- b. finding that Intel's infringement of one or more of each of the patents-in-suit is willful;
- c. awarding ParkerVision damages under 35 U.S.C. § 284, or otherwise permitted by law, including supplemental damages for any continued post-verdict infringement and enhanced damages in view of Intel's willful infringement;
- d. awarding ParkerVision pre-judgment and post-judgment interest on the damages award and costs;
- e. awarding cost of this action (including all disbursements) and attorney fees pursuant to 35 U.S.C. § 285, or as otherwise permitted by the law; and

- f. awarding such other costs and further relief that the Court determines to be just and equitable.

Dated: May 10, 2022

Respectfully submitted,

THE MORT LAW FIRM, PLLC

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